

WISENET

DIGITAL VIDEO RECORDER

Product Specification Manual

HRX-1621/HRX-1620
HRX-821/HRX-820
HRX-421/HRX-420

CE

Digital Video Recorder

Product Specification Manual

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❖ Design and specifications are subject to change without prior notice.

You can download the latest version from the Hanwha Techwin web site. (www.hanwha-security.com)

❖ The initial administrator ID is "admin" and the password should be set when logging in for the first time.

Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.

Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the unit.

Follow all the safety instructions listed below.

Keep these operating instructions handy for future reference.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean the contaminated area on the product surface with a soft, dry cloth or a damp cloth. (Do not use a detergent or cosmetic products that contain alcohol, solvents or surfactants or oil constituents as they may deform or cause damage to the product.)
- 7) Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding- type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. if the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Standards Approvals



- ! Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- ☒ This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
 - This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

BEFORE START

This manual provides operational information necessary for using the product and contains a description about each component part and its function as well as menu or network settings.

You have to keep in mind the following notices:

- Hanwha Techwin retains the copyright on this manual.
- This manual cannot be copied without Hanwha Techwin's prior written approval.
- We are not liable for any or all losses to the product incurred by your use of non-standard product or violation of instructions mentioned in this manual.
- Prior to opening the case, please consult a qualified technician first. Whenever this is needed power must be removed from the unit.
- Before adding a hard disk drive or external storage (USB memory, USB HDD, etc), check if it is compliant with this product. For the compatibility list, contact the retailer.

Warning

Battery

It is essential that when changing the battery in the unit, the replacement battery must be of the same type otherwise there may be a possibility of an explosion.

The following are the specifications of the battery you are using now.

- Normal voltage : 3V
- Normal capacity : 210mAh
- Continuous standard load : 0.4mA
- Operating temperature : -20°C ~ +60°C (-4°F ~ +140°F)

CALIFORNIA USA ONLY

This Perchlorate warning applies only to primary CR (Manganese Dioxide) Lithium coin cells in the product sold or distributed ONLY in California USA.

"Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate."

Caution

- Connect the power cord into a grounded outlet.
- The Mains plug is used as a disconnect device and shall stay readily operable at any time.
- Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.
- RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.
- When the HDD reaches its end of life, the stored video data may be damaged, and not be able to be recovered.
- The HDD status LED on the front of the system continuously blinks to indicate that the system's connection to the HDD is normal. Check the HDD status LED regularly to see if it blinks continuously. Recording may not be possible when there is an HDD failure.
Periodically check the recording status and backup important data regularly.

ATTENTION

- IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT.
METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.

System Shutdown

Turning off the power while the product is in operation, or undertaking improper actions may cause damage or malfunction to the hard drive or the product.

To safely power off, select Exit from the menu and click <OK> on the pop-up screen, then unplug the power cable.

You may want to install a UPS system for safe operation in order to prevent damage caused by an unexpected power stoppage. (Any questions concerning UPS, consult your UPS retailer.)

- ! If powered off abnormally, restarting may take more time for restoring data from hard disk drive for proper operation.

Operating Temperature

The guaranteed operating temperature range of this product is 0°C ~ 40°C (32°F ~ 104°F).

This product may not work properly if you run right after a long period of storage at a temperature below the guaranteed one.

Prior to using a device that has been stored for a long period in low temperatures, allow the product to stand at room temperature for a period.

Especially for the built-in HDD in the product, its guaranteed temperature range is 5°C ~ 55°C (41°F ~ 131°F). Likewise, the hard drive may not work at a temperature below the guaranteed one.

Ethernet Port

This equipment is in door use and all the communication wirings are limited to inside of the building.

Security Precautions

The initial administrator ID is "admin" and the password should be set when logging in for the first time.

Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.

Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

Products supporting each feature

Function	Products
Fan	HRX-1621, HRX-1620, HRX-821, HRX-820, HRX-421, HRX-420
P2P	HRX-1621, HRX-1620, HRX-821, HRX-820, HRX-421, HRX-420
RS-422/485	HRX-1621, HRX-821, HRX-421
RS-485	HRX-1620, HRX-820, HRX-420
Remote controller	HRX-1621, HRX-1620, HRX-821, HRX-820, HRX-421, HRX-420

CONTENTS

OVERVIEW

3 Important Safety Instructions
 3 Before Start
 5 Contents
 6 Features
 6 Package Contents
 7 Part Names and Functions (Front)
 8 Part Names and Functions (Rear)

3

INSTALLATION

9 Checking the installation environment
 9 Rack Installation
 9 HDD Addition

9

CONNECTING WITH OTHER DEVICE

12 Connecting to an external device
 12 Connecting the USB
 12 Connecting the Alarm Input/Output
 13 Connecting the Network

12

PRODUCT SPECIFICATION 15 Product specification

15

PRODUCT OVERVIEW 20 Product overview

20

FEATURES

The product records video and audio from cameras to a hard disk, and enables playback from the hard disk. It also provides remote monitoring environment for video and audio over the network using a remote computer.



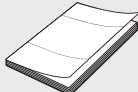

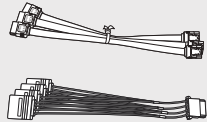

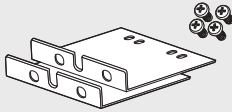

- User-friendly UI
- Supports a range of 4K analog/network camera resolutions
- Outputs a 4K high definition image using HDMI
- Record and play video
- Record and play audio
- Supports ONVIF Profile S standard and RTP / RTSP protocols
- Display the HDD operation status by HDD SMART
- Dual Stream recording
- HDD overwrite enabled
- Backup using USB 2.0, 3.0 protocols and external HDD
- Simultaneous play of 6, 10, 18 channels
- Various Search Modes (Time, Event, Smart, Text, Backup, ARB)
- Supports ARB (Network camera)
- Various Recording Modes (Normal, Event, Scheduled Recording)
- Alarm Input / Output
- Remote Monitoring function by UWA3.0
- Installation Wizard Function
- Supports the smartphone remote monitoring feature by P2P support
- Provides smartphone event alarm (sending real-time event messages)

PACKAGE CONTENTS



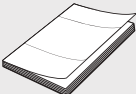


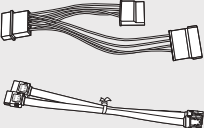

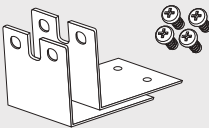

Please unwrap the product, and place the product on a flat place or in the place to be installed. Please check the following contents are included in addition to the main unit.

- ✍ The appearance of the components may differ from the image shown.
- Accessory category and quantity may differ depending on sales region.
- For some regions, HDD is not pre-installed. HDD Fixing Screw, SATA Cable quantity vary depending on the model.



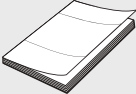




HRX-1621/HRX-821

			
Recorder	Mouse	Quick Manual	Power Cable
			
SATA Cable (HRX-1621: 8 EA, HRX-821: 4 EA)	HDD Fixing Screw (HRX-1621: 32 EA, HRX-821: 16 EA)	Bracket Rack (2 EA)/ Screw (4 EA)	Terminal block (HRX-1621: 15 pin, 20 pin, HRX-821: 12 pin, 15 pin)

HRX-1620/HRX-820/HRX-421

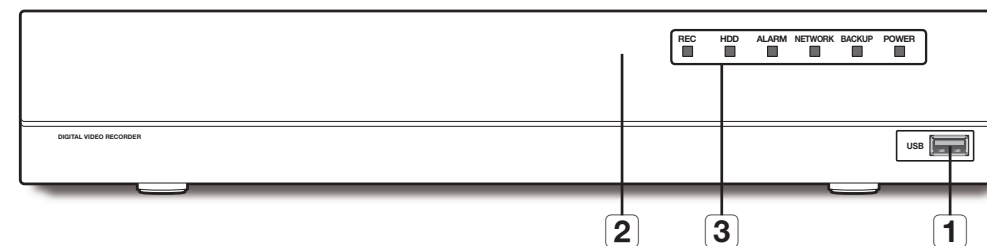
			
Recorder	Mouse	Quick Manual	Power Cable
			
Power Adaptor	SATA Cable (2 EA)	HDD Fixing Screw (8 EA)	Bracket Rack (2 EA)/ Screw (4 EA)
			
Terminal block (20 pin) (HRX-421 only)			

HRX-420

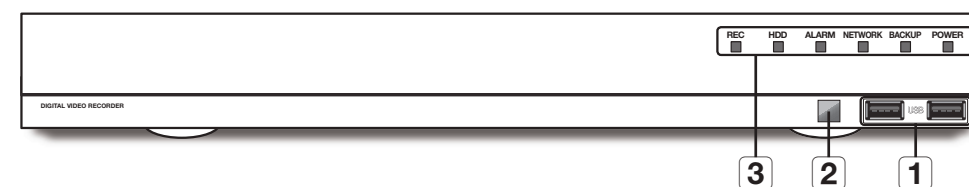
			
Recorder	Mouse	Quick Manual	Power Cable
			
Power Adaptor	SATA Cable (1 EA)	HDD Fixing Screw (4 EA)	

PART NAMES AND FUNCTIONS (FRONT)

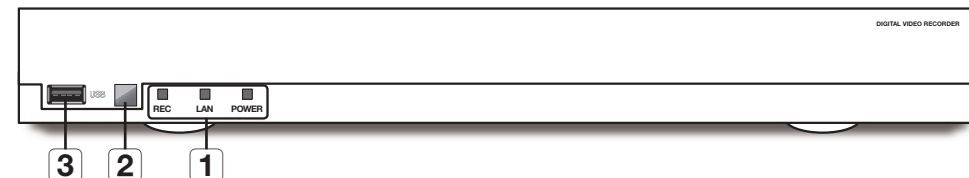
HRX-1621/HRX-821



HRX-1620/HRX-820/HRX-421



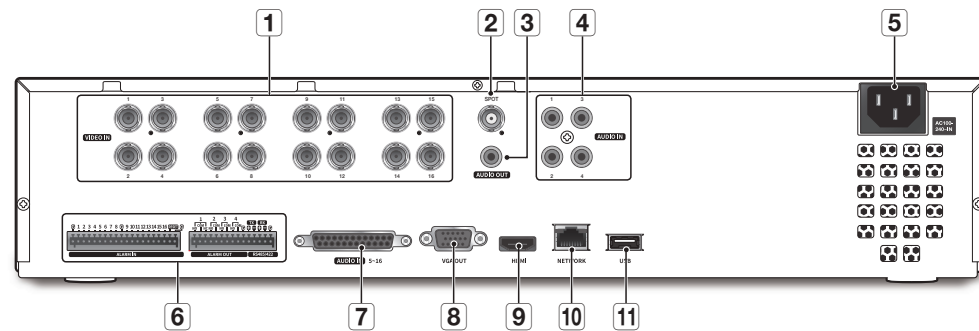
HRX-420



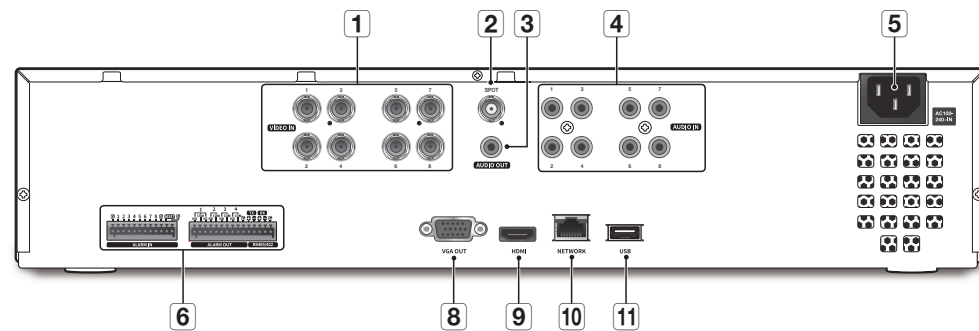
Part Names	Functions
1 USB	Connects the USB devices. (USB 2.0 supported)
2 Remote Reception System	Receive the signal from the remote control.
3 LED Indicator	REC : Lights on when recording is in progress.
	HDD : Displays the normal access to HDD. LED turns on when accessing the hard disk. (N/A on HRX-420)
	ALARM : Lights on when an event occurs. (N/A on HRX-420)
	NETWORK (LAN) : Displays both network connection and data transfer status.
	BACKUP : Stays ON when backup is in operation. (N/A on HRX-420)
	POWER : Shows the power ON/OFF status.

PART NAMES AND FUNCTIONS (REAR)

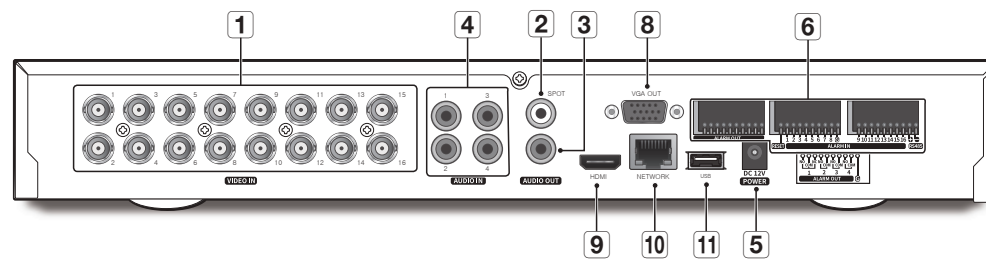
HRX-1621



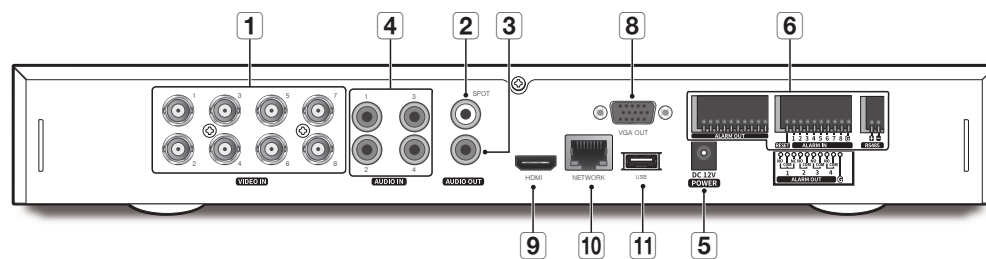
HRX-821



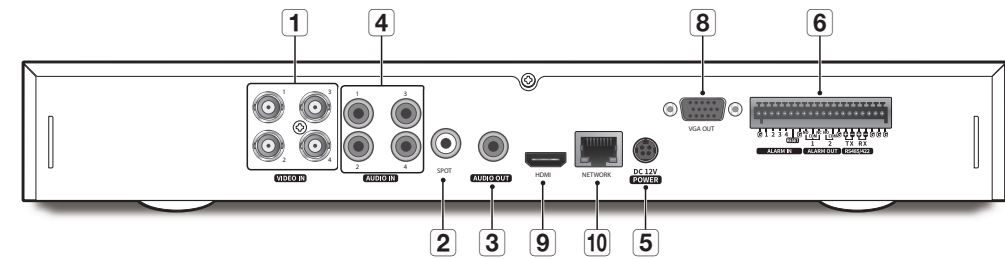
HRX-1620



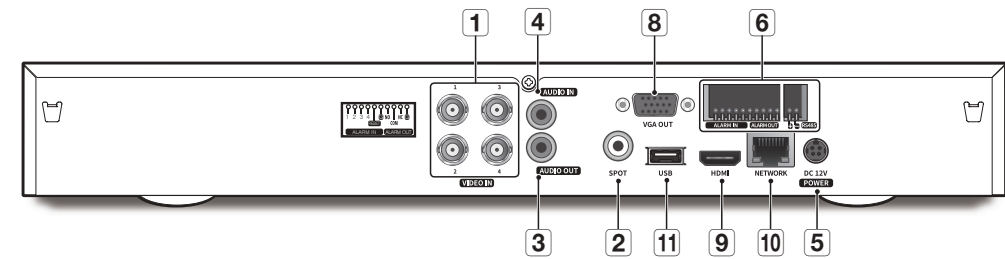
HRX-820



HRX-421



HRX-420



Part Names	Functions
1 VIDEO IN	Video Signal Input Port (BNC type connector).
2 SPOT	BNC type of output port for the Spot signal.
3 AUDIO OUT	Audio Signal Output Port (RCA jack).
4 AUDIO IN	Audio input signal port (RCA jack).
5 POWER	Terminal to connect power to.
6 ALARM	<ul style="list-style-type: none"> ALARM IN : Alarm input ports. HRX-1621/HRX-1620 : 1~16 CH HRX-821/HRX-820 : 1~8 CH HRX-421/HRX-420 : 1~4 CH ALARM OUT : Alarm output ports. HRX-1621/HRX-821/HRX-820/HRX-421 : 1~4 CH HRX-821 : 1~8 CH HRX-421 : 1~2 CH HRX-420 : 1 CH
RS485/422	Used to establish RS-485 or RS-422 communications. (TX+, TX-, RX+, RX-)
7 AUDIO IN 5~16	Audio extension port (Sold separately).
8 VGA OUT	VGA Video Signal Output Port.
9 HDMI	HDMI connector port.
10 NETWORK	NETWORK connector port.
11 USB	Connects the USB devices. (USB 3.0 supported)

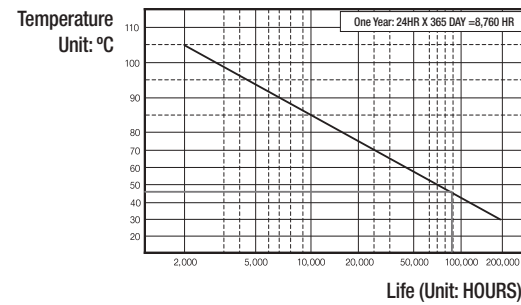
Please take note of the followings before using this product.

- Do not use the product outdoor.
- Do not spill water or liquid in the connection part of the product.
- Do not impose the system to excessive shock or force.
- Do not pull out the power plug forcefully.
- Do not disassemble the product on your own.
- Do not exceed the rated input/output range.
- Use a certified power cord only.
- For the product with an input ground, use a grounded power plug.

CHECKING THE INSTALLATION ENVIRONMENT

This product is a top-notch security device that is equipped with a high-capacity HDD and other key circuit boards.

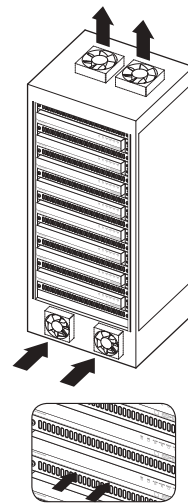
Note that an excessive internal temperature of the product may cause a system failure or a shortened product life (see the right figure). Keep in mind the following instructions before installing the product.



[Figure 1]

When mounting the product on a rack, comply with the following instructions.

1. Please ensure that the rack inside is not sealed.
2. Please ensure the air is circulated through the inlet/outlet as shown in the picture.
3. If you pile up the products or other rack-mount devices as shown in figure 2, secure room for ventilation or install a vent.
4. For natural air convection, place the inlet at the bottom of the rack and the outlet on top.
5. It is strongly recommended that a fan motor is installed at the inlet and the outlet for air circulation. (Please fit a filter at the inlet to screen dust or foreign substances.)
6. Please maintain the temperature inside the rack or surrounding areas between 0°C ~ 40°C (32°F ~ 104°F) as shown in the figure 1.

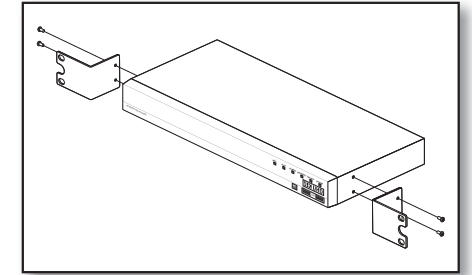


[Figure 2]

RACK INSTALLATION

Install the Bracket-Rack as shown in the figure, and then fasten the screws on both sides.

- Fix the screws not to be loosened by vibrations.



<HRX-821>

HDD ADDITION

Make sure to unplug the power cord from the wall outlet to prevent possible electric shock, injury or product damage. Please consult your provider for further information on HDD installation since improper installation or settings may damage the product.

- Number of HDDs supported
 - HRX-1621 : Max. 8 EA
 - HRX-821 : Max. 4 EA
 - HRX-1620/HRX-820/HRX-421 : Max. 2 EA
 - HRX-420 : 1 EA
- Make sure to unplug the power cord from the wall outlet before proceeding with the installation.




! Cautions for data loss (HDD care)

- Please pay attention so that the data inside the HDD is not damaged. Before adding a HDD, please check the compatibility with this product. HDD is vulnerable to malfunction due to its sensitive nature especially against shock when operating. Please ensure that the HDD is free from such shock. We are not liable for any damage to the HDD incurred by user's carelessness or miss use.
- **Cases might cause damage to HDD or recorded data**
 - To minimize the risk of data loss from a damaged HDD, please backup data as often as possible.
 - If exposed to shock when disassembling or installing, data stored in the hard disk may be damaged.
 - A sudden power failure or turning off the product while in HDD operation may damage the hard disk drive.
 - HDD or files stored inside may be damaged if the main body is moved or impacted during the HDD operation.

Cautions when installing a HDD

1. Do not apply excessive force to the HDD.
2. Pay attention so as not to lose the disassembly screws or accessories.
 - If the screws or accessories are not put together correctly, the product may breakdown or not operate properly.
3. Please check the HDD compatibility before adding a HDD.
 - Please contact your nearest dealer to obtain the list of compatible devices.

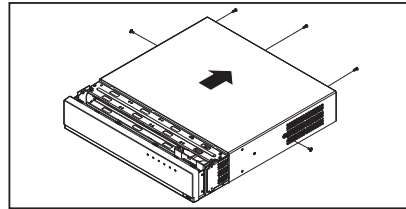
Installing the HDD

- 
 If you are adding a new or previously used HDD to this product in addition to the HDD(s) originally installed, format the new HDD manually in the set before use.
 To learn how to format, see "**Device/Format**" in the Wisenet Recorder User Manual.

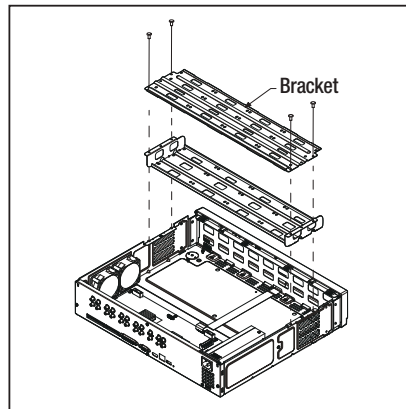
How to install an HDD in HRX-1621/HRX-821

- 
 The following figures are based on Model HRX-1621.

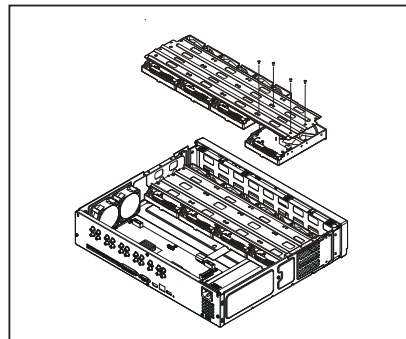
1. Loosen the screws on the left/right sides and back and slide the cover back to remove it.



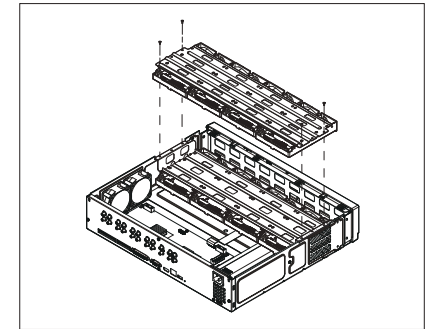
2. Loosen the left/right screws and remove the bracket.



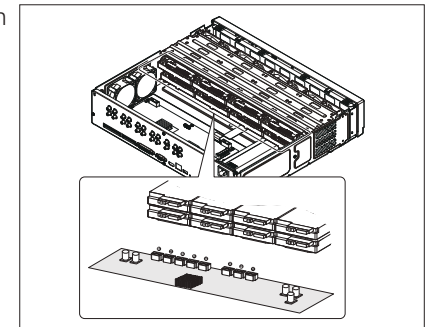
3. Install 8 HDDs to the bracket and fix them with screws.
For the HRX-821, install the HDD only to the bottom bracket.



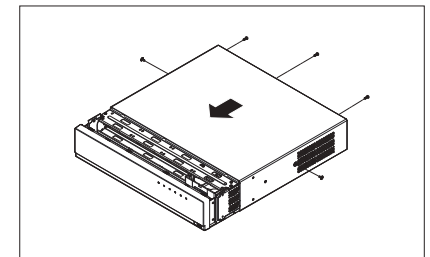
4. Fix the bracket with the HDD to the recorder with screws.



5. Connect the SATA/power cable of the HDD to the connector on the motherboard.
Refer to the figure below for the location/connector number of the HDD.



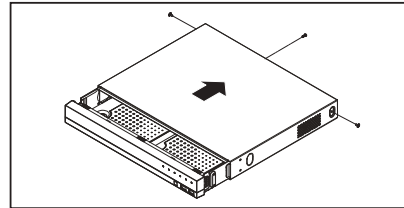
6. After making sure that there is no problem with the connection terminal and wiring inside the product, close the cover and fix it with screws.



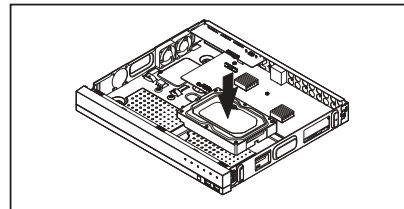
How to install an HDD in HRX-1620/HRX-820/HRX-421

 The following figures are based on Model HRX-1620.

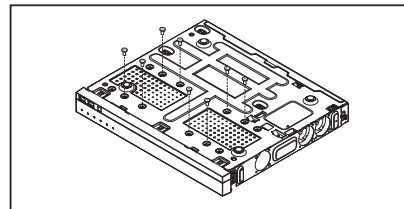
1. Loosen the screws on the left/right sides and back and slide the cover back to remove it.



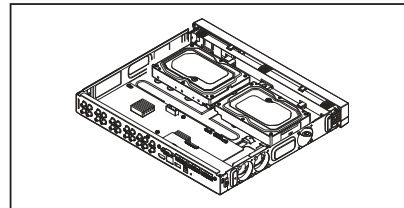
2. Connect the SATA/power cable of the HDD to the connector on the motherboard.



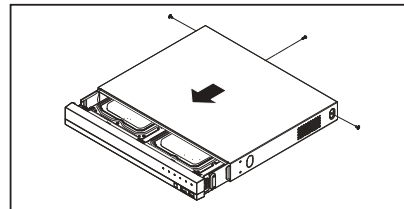
3. Fix the HDD to the bottom of the recorder with screws.



4. Check if there is any problem with the connection terminal and wiring inside the product.

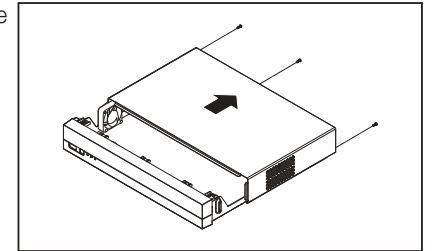


5. Close the cover and secure it with screws.

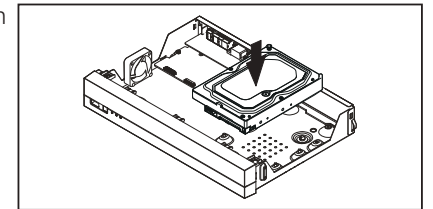


How to install an HDD in HRX-420

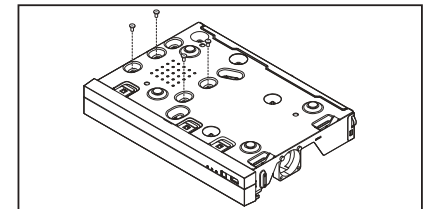
1. Loosen the screws on the left/right sides and back and slide the cover back to remove it.



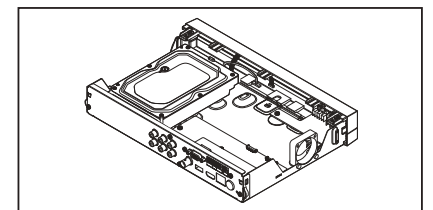
2. Connect the SATA/power cable of the HDD to the connector on the motherboard.



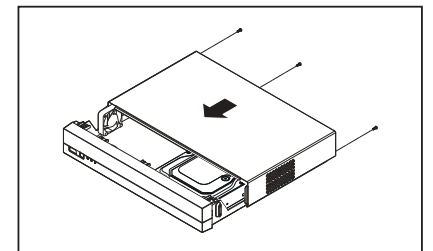
3. Fix the HDD to the bottom of the recorder with screws.



4. Check if there is any problem with the connection terminal and wiring inside the product.

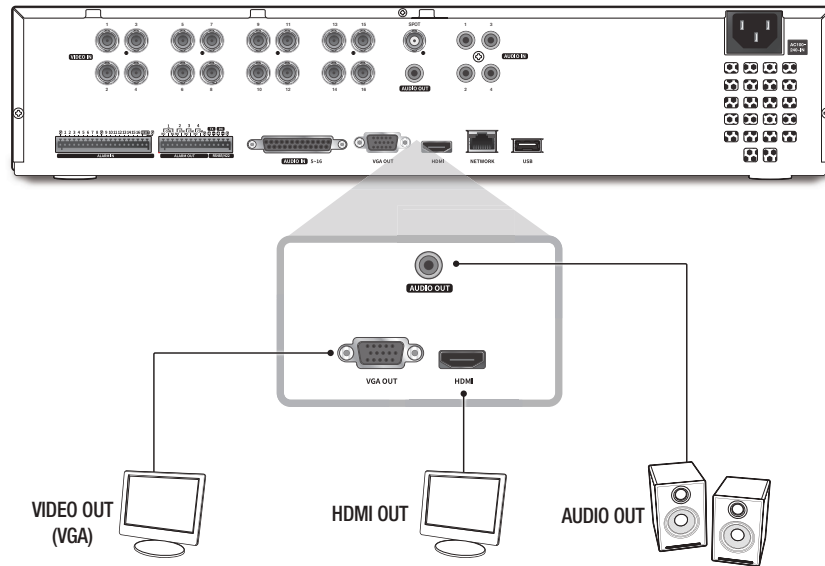


5. Close the cover and secure it with screws.



CONNECTING TO AN EXTERNAL DEVICE

■ The following figures are based on Model HRX-1621.

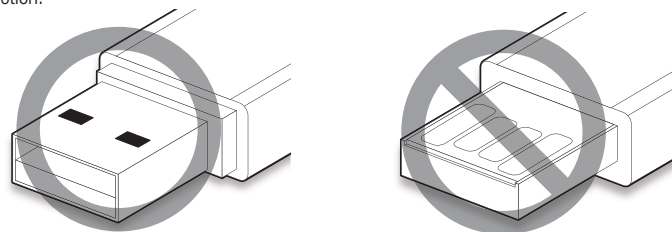


! ■ Unrated or improper power source may cause damage to the system. Ensure that you use only the rated power source before pressing the POWER button.

CONNECTING THE USB

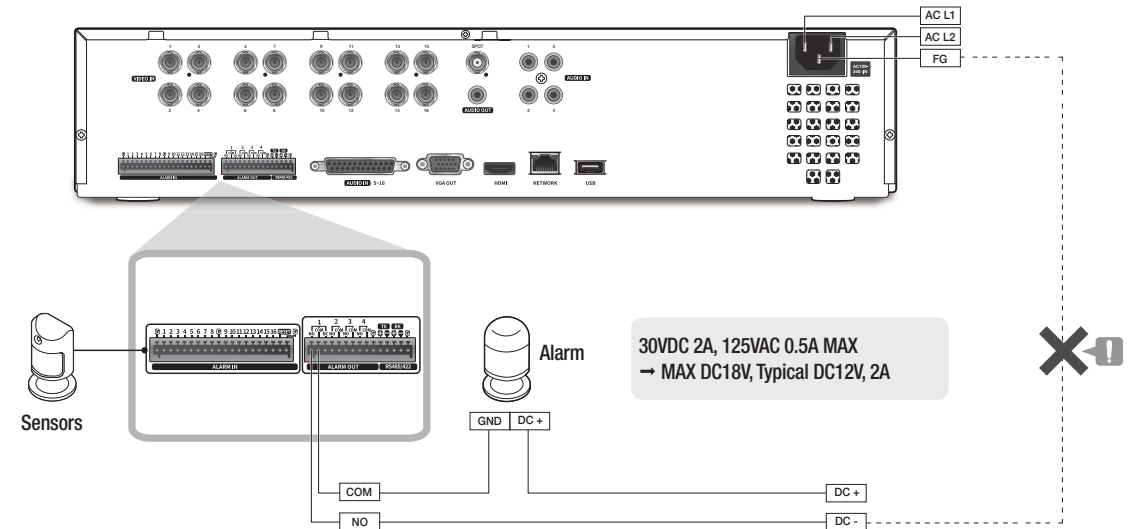
1. On the front of the product, there is a USB port.
2. You can connect a USB HDD, USB memory or mouse to the USB port.
3. If your USB HDD is connected to the system, it can be detected and set up by following the steps in "**Menu > Device > Storage Device**" of the Wisenet Recorder User Manual.
4. The product supports hot plugging function that enables connecting/disconnecting USB devices while in operating the system.

! ■ If you use the USB device for Backup purposes, format it with FAT32 on PC if it is not formatted on the Recorder.
 ■ Some USB devices may fail to function properly due to compatibility issue, please check the device before using.
 ■ Only USB storage devices that comply with the standards (having a metal cover) are guaranteed for data transfer.
 ■ In case if the USB device's electric contacts have been worn out, data transfer between the devices may not properly function.

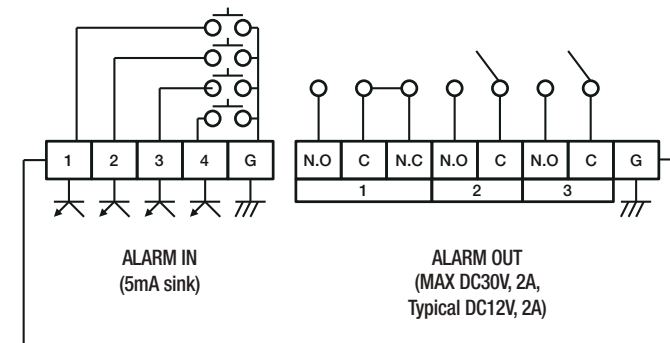


CONNECTING THE ALARM INPUT/OUTPUT

The Alarm In/Out port at the back is composed of the following.



- ALARM IN : Alarm Input Port
- ALARM OUT : Alarm Output Port

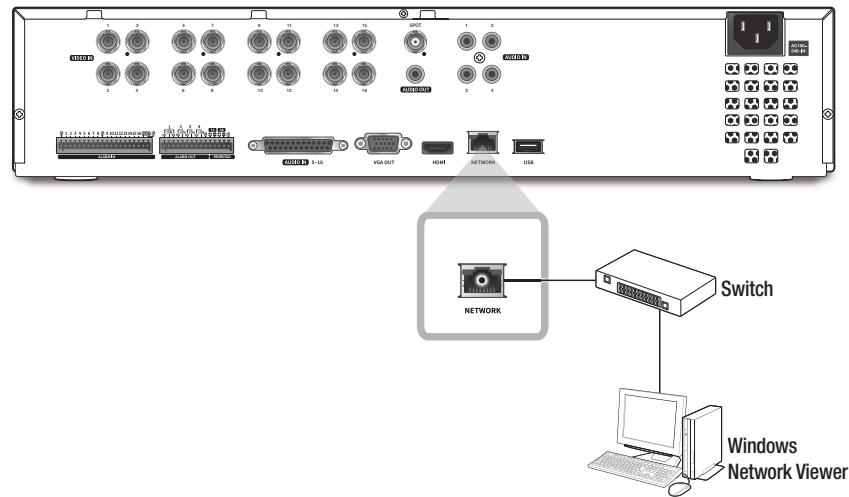


! ■ Do not connect the Alarm power (DC-) to the Ground signal (FG) of the Recorder.

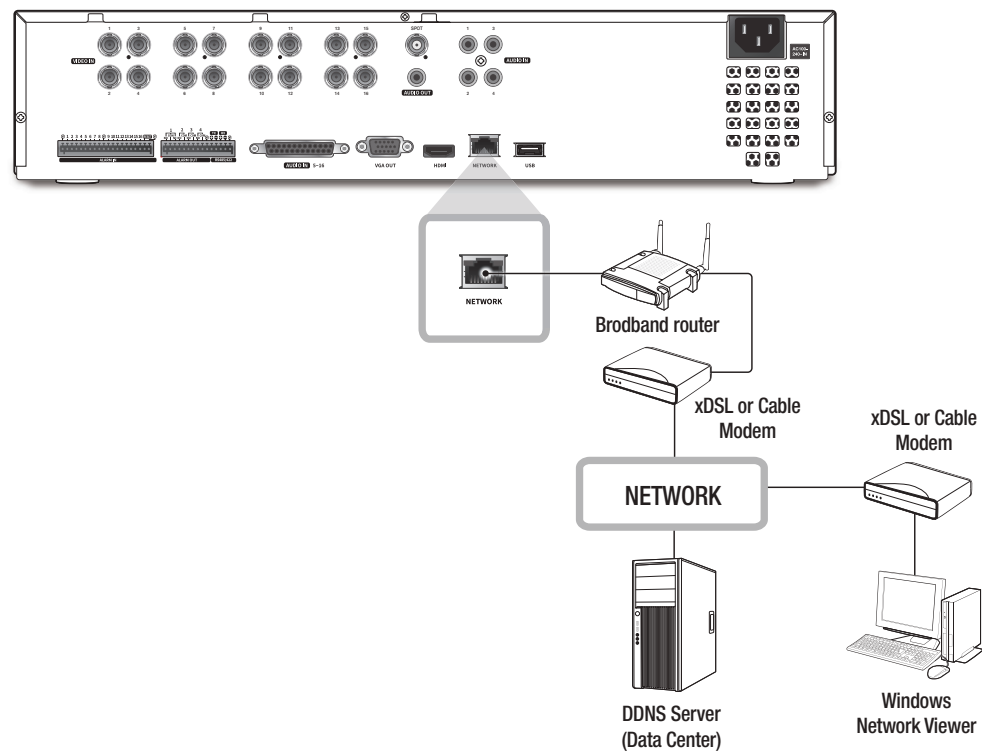
CONNECTING THE NETWORK

- For more information about network connection, see "Network Configuration" in the Wisenet Recorder User Manual.
- The following figures are based on Model HRX-1621.

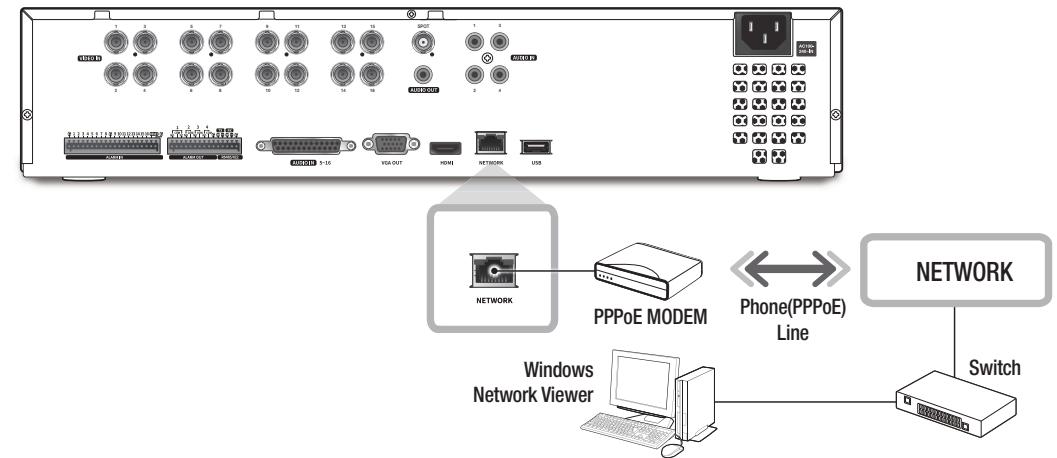
Network connection via Ethernet (10/100/1000BaseT)



Network connection via router

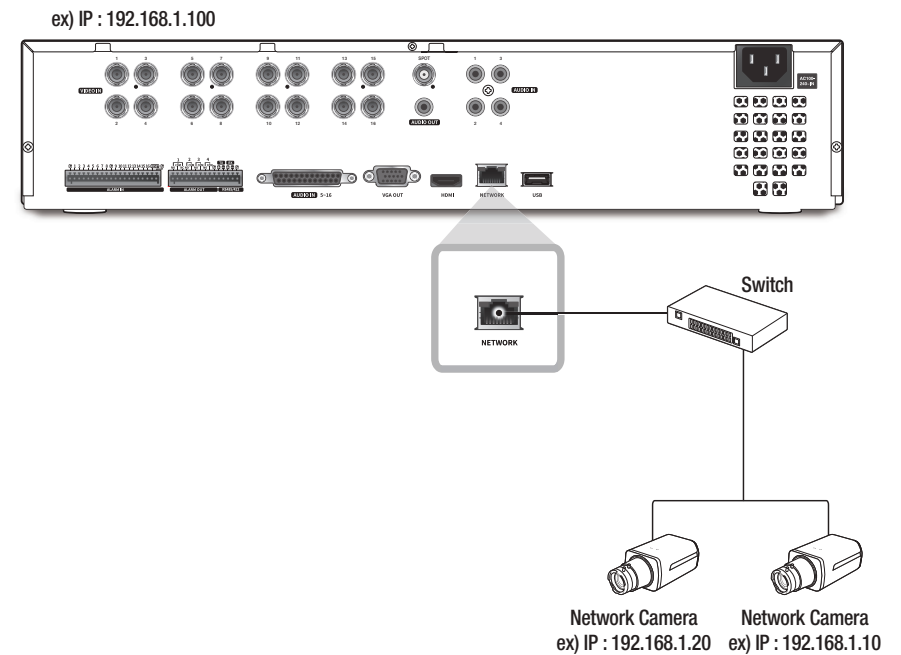


Connecting to Internet through PPPoE



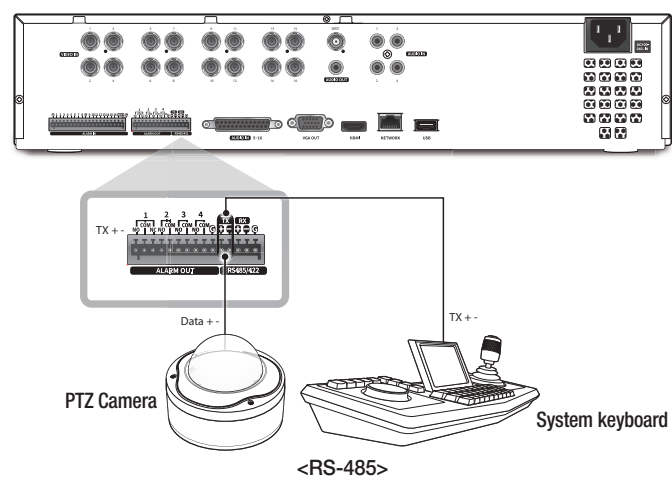
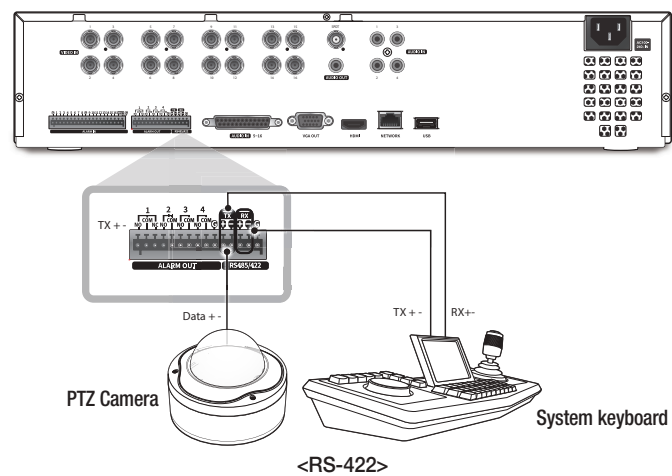
Connecting the network camera

Example)



Connecting the RS-485 Device

Connect [TX/RX +,-] port on the rear to PTZ camera or system keyboard.



- ✍️ You can connect and control the PTZ camera which supports the RS-485 communication.
- Check if the RS-485 device is compatible with the product first.
- Pay attention not to change the polarity (+/-) of the RS-485 device when connecting it.
- Depending on camera's type, connection polarity can be different.
- For further information, refer to the respective PTZ Camera's documentation.

Item		Details						
		HRX-1621	HRX-821	HRX-421	HRX-1620	HRX-820	HRX-420	
Video								
Video Input	Maximum input channel	18 CH	10 CH	6 CH	18 CH	10 CH	6 CH	
	Analog Camera	Inputs	16 CH, 1Vp-p 75ohm, BNC	8 CH, 1Vp-p 75ohm, BNC	4 CH, 1Vp-p 75ohm, BNC	16 CH, 1Vp-p 75ohm, BNC	8 CH, 1Vp-p 75ohm, BNC	4 CH, 1Vp-p 75ohm, BNC
		Signal Type	AHD(8MP, 5MP, 4MP, 1080p, 720p) HDTVI(8MP, 5MP, 4MP, 1080p, 720p) HDCVI(5MP, 4MP, 1080p, 720p) CVBS (NTSC/PAL)		AHD(8MP, 5MP, 4MP, 1080p, 720p) HDTVI(8MP, 5MP, 4MP, 1080p, 720p) HDCVI(5MP, 4MP, 1080p, 720p) CVBS (NTSC/PAL) * 8MP only supported on 1 channel	AHD(8MP, 5MP, 4MP, 1080p, 720p) HDTVI(8MP, 5MP, 4MP, 1080p, 720p) HDCVI(5MP, 4MP, 1080p, 720p) CVBS (NTSC/PAL)		AHD(8MP, 5MP, 4MP, 1080p, 720p) HDTVI(8MP, 5MP, 4MP, 1080p, 720p) HDCVI(5MP, 4MP, 1080p, 720p) CVBS (NTSC/PAL) * 8MP only supported on 1 channel
	Network Camera	Input	2CH (up to 18CH)	2CH (up to 10CH)	2CH (up to 6CH)	2CH (up to 18CH)	2CH (up to 10CH)	2CH (up to 6CH)
		Resolution	CIF ~ 8MP					
		Protocols	SUNAPI(Wisenet), ONVIF					
Live	Local Display	1x HDMI, 1x VGA (Dual monitor)		1x HDMI, 1x VGA	1x HDMI, 1x VGA (Dual monitor)		1x HDMI, 1x VGA	
	Multi Screen display	[Local monitor] 1, 2H, 2V, 3V, 4, 6(1+5), 8(1+7), 9, 13, 16, 20(5x4) / Auto sequence, [Web] 1 / 4 / 9 / sequence	[Local monitor] 1 / 2H / 2V / 3V / 4 / 6(1+5) / 12(4x3) / 8(1+7) / 9 / Auto sequence [Web] 1 / 4 / 9	[Local monitor] 1 / 2H / 2V / 3V / 4 / 6(1+5) / 6(3x2) / Auto sequence [Web] 1 / 4	[Local monitor] 1, 2H, 2V, 3V, 4, 6(1+5), 8(1+7), 9, 13, 16, 20(5x4) / Auto sequence [Web] 1 / 4 / 9 / sequence	[Local monitor] 1 / 2H / 2V / 3V / 4 / 6(1+5) / 12(4x3) / 8(1+7) / 9 / Auto sequence [Web] 1 / 4 / 9	[Local monitor] 1 / 2H / 2V / 3V / 4 / 6(1+5) / 6(3x2) / Auto sequence [Web] 1 / 4	
	Performance	Analog Camera (NTSC/PAL) 8MP(15/12fps), 5MP(20/12fps), 4MP(30/25fps), 2MP(30/25fps), 1MP(30/25fps), 960H(or 720H)(30/25fps) * per CH						
		Network Camera : Typ. 2MP(480fps)	Network Camera : Typ. 2MP(240fps)	Network Camera : Typ. 2MP(120fps)	Network Camera : Typ. 2MP(480fps)	Network Camera : Typ. 2MP(240fps)	Network Camera : Typ. 2MP(120fps)	
Performance								
Operating System	Embedded	Linux						

Item		Details					
		HRX-1621	HRX-821	HRX-421	HRX-1620	HRX-820	HRX-420
Recording	Compression	H.265, H.264, MJPEG					
	Record Rate(Analog)	Analog Camera(NTSC/PAL) (Main Stream) 8MP 8/8fps CH, 5M 12/12fps CH, 4M 15/12fps CH, 2M 30/25fps CH, 720p 30/25fps/CH, SD 30/25fps/CH (Sub Stream) 720p or higher : 640x360 full fps/CH, SD signal : upto SD full fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.					
	Bandwidth	Max. 70Mbps (Analog Camera only) ~ 51Mbps (Network Camera only)	Max. 40Mbps (Analog Camera only) ~ 28Mbps (Network Camera only)	Max. 25Mbps (Analog Camera only) ~ 17Mbps (Network Camera only)	Max. 70Mbps (Analog Camera only) ~ 51Mbps (Network Camera only)	Max. 40Mbps (Analog Camera only) ~ 28Mbps (Network Camera only)	Max. 25Mbps (Analog Camera only) ~ 17Mbps (Network Camera only)
	Mode	Manual, Schedule (Continuous/Event), Event(Pre/Post), Dual Track					
	Event Trigger	Alarm Input Analog Camera : Video Loss, Motion Detection, Tampering Network Camera : Camera Event (Sensor, MD, Video analytics), VA event (Tampering, Enter / Exit, Passing, Virtual- line, (Dis)Appear, Face Detection, Audio detection), Defocus camera event					
	Event Action	E-mail, PTZ preset, Alarm out, Buzzer, Monitor out					
	Overwrite modes	On/Off					
	Pre-alarm	Up to 15 sec					
Post-Alarm	Up to 6 hours						
Search & Playback	Playback Bandwidth	32Mbps (18 CH simultaneously)	32Mbps (10 CH simultaneously)	32Mbps (6 CH simultaneously)	32Mbps (18 CH simultaneously)	32Mbps (10 CH simultaneously)	32Mbps (6 CH simultaneously)
	Performance	Max. 4 users (Set 1, Remote 3)					
	mode	Date & Time (Calendar) / Event log list / Text search (POS), Back up, Motion, Smart search (Virtual Line w/ direction, Enter / Exit) * All Search Included Preview Function ARB search					
	Simultaneous playback	18 CH (Local Monitor) 4 CH (CMS, Wisenet Mobile), 1 CH (Web)	10 CH (Local Monitor) 4 CH (CMS, Wisenet Mobile), 1 CH (Web)	6 CH (Local Monitor) 4 CH (CMS, Wisenet Mobile), 1 CH (Web)	18 CH (Local Monitor) 4 CH (CMS, Wisenet Mobile), 1 CH (Web)	10 CH (Local Monitor) 4 CH (CMS, Wisenet Mobile), 1 CH (Web)	6 CH (Local Monitor) 4 CH (CMS, Wisenet Mobile), 1 CH (Web)
	Resolution	CIF ~ 8MP					
	Playback Control	Fast Forward/Backward (x2,x4,x8,x16,x32,x64, x128, x256) Slow Forward/Backward (x1/2,x1/4,x1/8) Move one step up/down					
Storage	Internal	Up to 8 SATA HDDs Max. 6TB/HDD	Up to 4 SATA HDDs Max. 6TB/HDD	Up to 2 SATA HDDs Max. 6TB/HDD		Up to 1 SATA HDDs Max. 6TB/HDDC	
	External	USB (for Backup)					

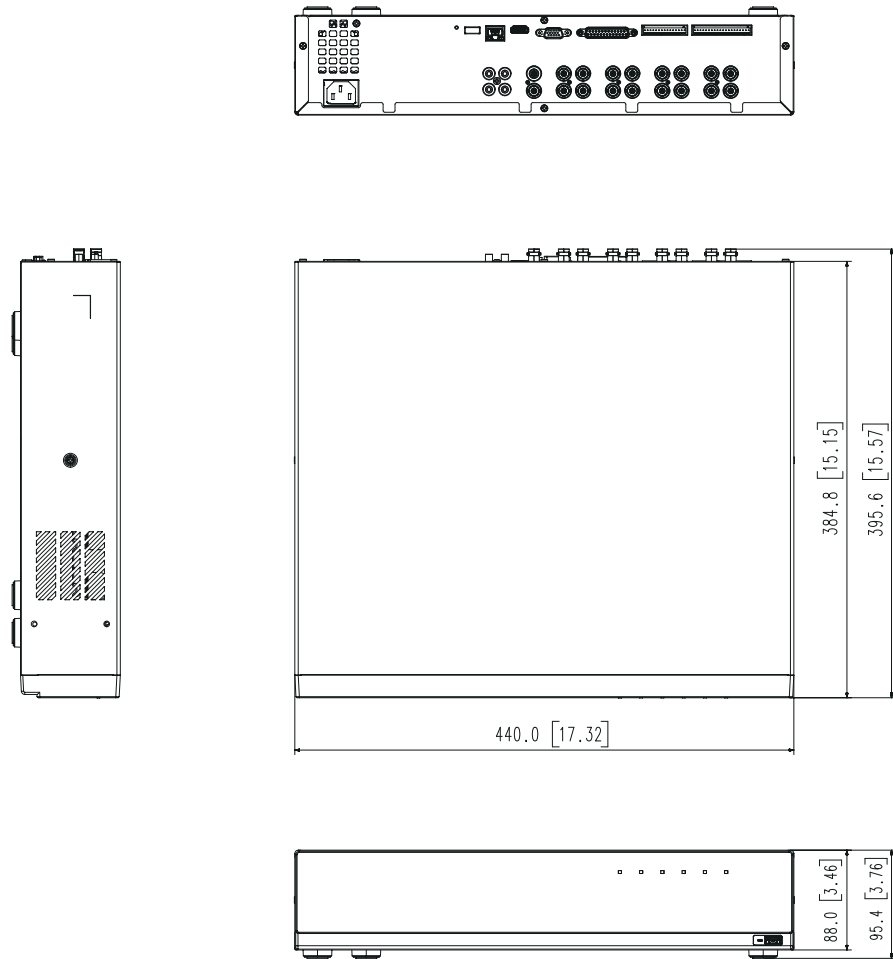
Item		Details					
		HRX-1621	HRX-821	HRX-421	HRX-1620	HRX-820	HRX-420
Backup	File Format	BU, EXE(Include Player), AVI(Webviewer only)					
	Function	Max. 16 CH play, Date-time/title display	Max. 10 CH play, Date-time/title display	Max. 6 CH play, Date-time/title display	Max. 16 CH play, Date-time/title display	Max. 10 CH play, Date-time/title display	- Max. 6 CH play, Date-time/title display
Network							
Protocol support		TCP/IP, UDP/IP, RTP (UDP), RTP (TCP), RTSP, NTP, HTTP, DHCP (Server, Client), PPPoE, SMTP, ICMP, IGMP, ARP, DNS, DDNS, uPnP, HTTPS, SNMP, ONVIF (Profile-S), SUNAPI(Server, Client)					
DDNS		WISENET DDNS					
Transmission speed		Analog Camera(NTSC/PAL) (Main Stream) 8MP 8/8fps CH, 5M 12/12fps CH, 4M 15/12fps CH, 2M 30/25fps CH, 720p 30/25fps/CH, SD 30/25fps/CH, 720p 30/25fps/CH, SD 30/25fps/CH (Sub Stream) 720p or higher : 640x360 full fps/CH, SD signal : upto SD full fps/CH * The maximum recording frame rate depends on the frame rate of the input camera.					
Transmission Bandwidth		Max. 30Mbps	Max. 20Mbps	Max. 15Mbps	Max. 30Mbps	Max. 20Mbps	- Max. 15Mbps
Max. Remote users		Search (3), Live Unicast (10), Multicast (20)					
IP Version		IPv4/v6					
Security		IP address filtering, User access log, 802.1x Authentication, Encryption (ID/PW, Recording, Transmission, Backup)					
Viewer Software	Type	SSM, Webviewer, SmartViewer, Wisenet Mobile Viewer					
	CMS Support	SDK/CGI (SUNAPI)					
Function							
Easy Configuration		Setup Wizard (Language Date/Time, Password, Network, Auto Camera Configuration), P2P (QR code)					
ARB (Auto Recovery Backup)		Support					
PTZ	Control/Presets	Recorder, Webviewer, SSM, SmartViewer, Wisenet Mobile Viewer, System Controller/300 presets					
Smart phone	OS / Protocol support	Android , iOS, RTP, RTSP, HTTP, CGI(SUNAPI)					
	Control	Live(16 CH) : Multi-Profile Support Playback(4 CH Multi Playback, Max 2MP) Event push	Live(8 CH) : Multi-Profile Support Playback(4 CH Multi Playback, Max 2MP) Event push	Live(4 CH) : Multi-Profile Support Playback(4 CH Multi Playback, Max 2MP) Event push	Live(16 CH) : Multi-Profile Support Playback(4 CH Multi Playback, Max 2MP) Event push	Live(8 CH) : Multi-Profile Support Playback(4 CH Multi Playback, Max 2MP) Event push	Live(4 CH) : Multi-Profile Support Playback(4 CH Multi Playback, Max 2MP) Event push
	Remote users Maximum	Search (3), Live Unicast (10)					
System Control		Mouse, IR Remocon, Webviewer, System Controller(SPC-7000, SPC-6000, SPC-2000)					

Item		Details					
		HRX-1621	HRX-821	HRX-421	HRX-1620	HRX-820	HRX-420
Indicator / Interface							
Front	Indicator	Power status LED 1ea, HDD Action LED 1ea, Alarm Status LED 1ea, Record status LED 1ea, Network Action LED 1ea, Backup LED 1ea					Power status LED 1ea, Record status LED 1ea, Network Action LED 1ea
Monitors	Mode	HDMI/VGA (Dual Monitor)		HDMI/VGA	HDMI/VGA (Dual Monitor)		HDMI/VGA
	HDMI	1 HDMI (4K(3840x2160), 2K(2560x1440), 1920x1080, 1280x1024, 1280x720) at Dual Monitor(Expand), HDMI is FHD output		1 HDMI (4K(3840x2160), 2K(2560x1440), 1920x1080, 1280x1024, 1280x720)	1 HDMI (4K(3840x2160), 2K(2560x1440), 1920x1080, 1280x1024, 1280x720) at Dual Monitor(Expand), HDMI is FHD output		1 HDMI (4K(3840x2160), 2K(2560x1440), 1920x1080, 1280x1024, 1280x720)
	VGA	1 VGA (1920x1080, 1280x1024, 1280x720)					
	Composite(Spot)	BNC (1 CH) * Included OSD On Screen, Single, Multi, Auto Change mode Support					
Audio	Inputs/Output	16 Line in (Built in 4 Line, Option : Audio Extension Cable) / 1Line line out	8 Line in / 1 Line out	4 Line in / 1 Line out			1 Line in / 1 Line out
	Compression	G.711 (N/W Cam G.711, 726)					
	Sampling Rate	8KHz (N/W Cam G.711/8KHz, G.726/40KHz)					
Alarm	Inputs/Outputs	Terminal 16 Inputs (NO/NC) / Terminal 4 relay Outputs (NO/NC & NO) MAX DC18V, 2A, Typical DC12V, 2A	Terminal 8 Inputs (NO/NC) / Terminal 4 relay Outputs (NO/NC & NO) MAX DC18V, 2A, Typical DC12V, 2A	Terminal 4 Inputs (NO/NC) / Terminal 2 relay Outputs (NO/NC & NO) MAX DC18V, 2A, Typical DC12V, 2A	Terminal 16 Inputs (NO/NC) / Terminal 4 relay Outputs (NO/NC) MAX DC18V, 2A, Typical DC12V, 2A	Terminal 8 Inputs (NO/NC) / Terminal 4 relay Outputs (NO/NC) MAX DC18V, 2A, Typical DC12V, 2A	Terminal 4 Inputs (NO/NC) / Terminal 1 relay Outputs (NO/NC) MAX DC18V, 2A, Typical DC12V, 2A
	Remote Notification	Notification via e-mail					
Ethernet	1 RJ45 10/100/1000 Base-T						
USB	1 port(USB 3.0, Rear), 1 port(USB 2.0, Front)			2 ports(USB 2.0, Front/Rear)	1 port(USB 3.0, Rear), 2 ports(USB 2.0, Front)		2 ports(USB 2.0, Front/Rear)
Serial	RS-485/422 for PTZ Samsung-T/Pelco-D/Pelco-p				RS-485 for PTZ Samsung-T/Pelco-D/Pelco-p		
Coaxia Control	CVBS(Pelco-C)/AHD/CVI/TVI)						
Reset	Yes (Factory Reset, Alarm Reset)						

Item		Details					
		HRX-1621	HRX-821	HRX-421	HRX-1620	HRX-820	HRX-420
General							
Electrical	Input Voltage	100 ~ 240 VAC ±10%; 50/60 Hz		DC12V			
	Power consumption	180 W (6T HDD 8 ea)	130 W (6T HDD 4 ea)	28 W (6T HDD 2 ea)	41 W (6T HDD 2 ea)	32 W (6T HDD 2 ea)	14 W (6T HDD 1 ea)
Environmental	Operating Temperature/Humidity	+0°C ~ +40°C (+32°F ~ +104°F) / 20% ~ 85% RH					
Mechanical	Color / Material	Black / Metal					
	Dimension (W x H x D)	440 x 88 x 384.8 (17.32" x 3.46" x 15.15")		370 x 44 x 320 (14.57" x 1.73" x 12.6")		300 x 47 x 208.7 (11.81" x 1.85" x 8.22")	
	Weight (with hard disks)	5.6 Kg (4TB HDD 1 ea)	4.6 Kg (4TB HDD 1 ea)	2.3 Kg (4TB HDD 1 ea)	2.6 Kg (4TB HDD 1 ea)	2.5 Kg (4TB HDD 1 ea)	1.5 Kg (4TB HDD 1 ea)
Language	Recorder	English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Swedish, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese, Thai					
	Web	English, French, German, Italian, Spanish, Russian, Turkish, Polish, Dutch, Swedish, Czech, Portuguese, Danish, Rumanian, Serbian, Croatian, Hungarian, Greek, Norwegian, Finnish, Korean, Chinese, Japanese					

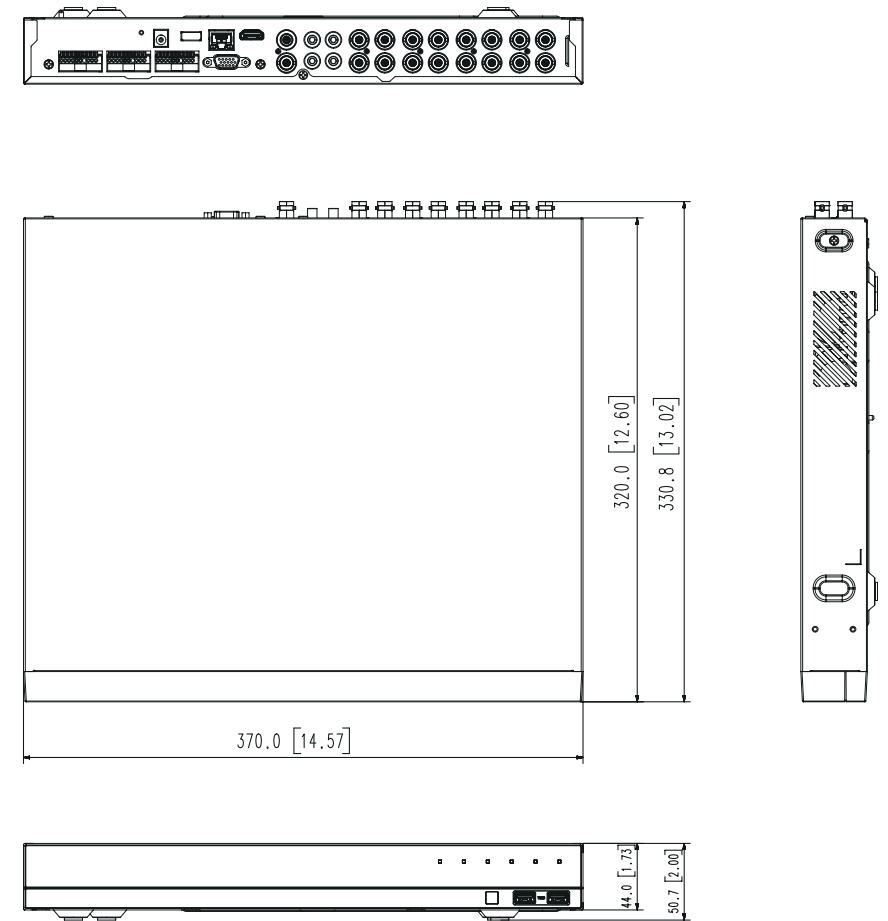
• HRX-1621

unit : mm (inches)



• HRX-1620

unit : mm (inches)

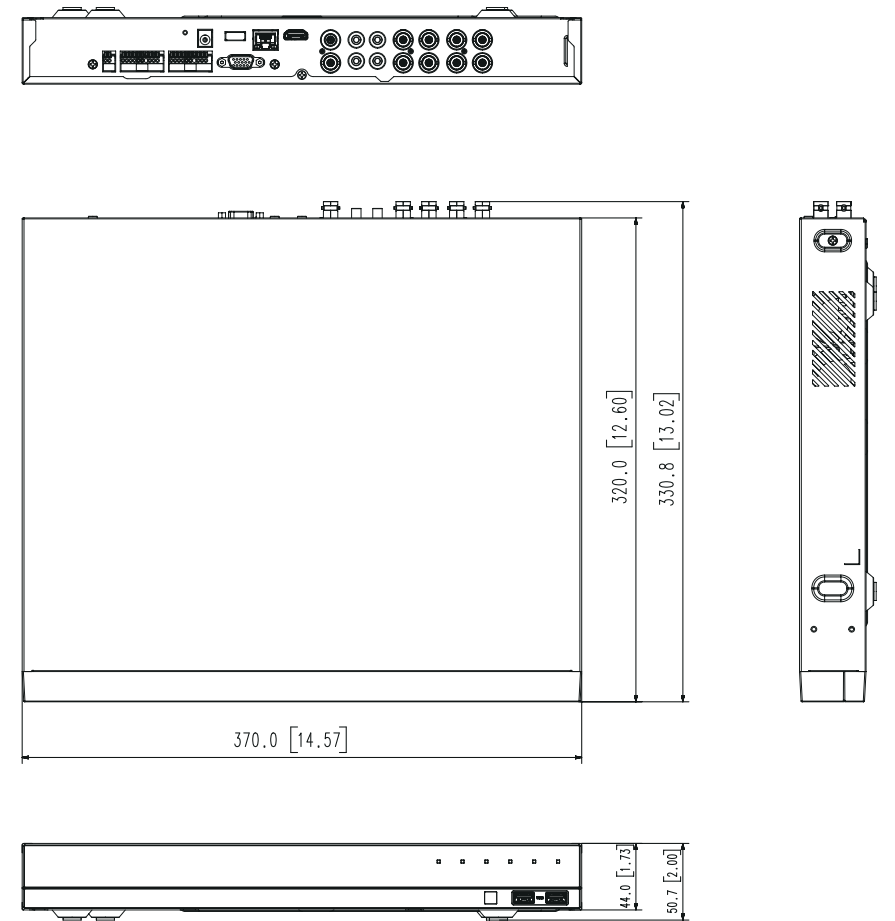
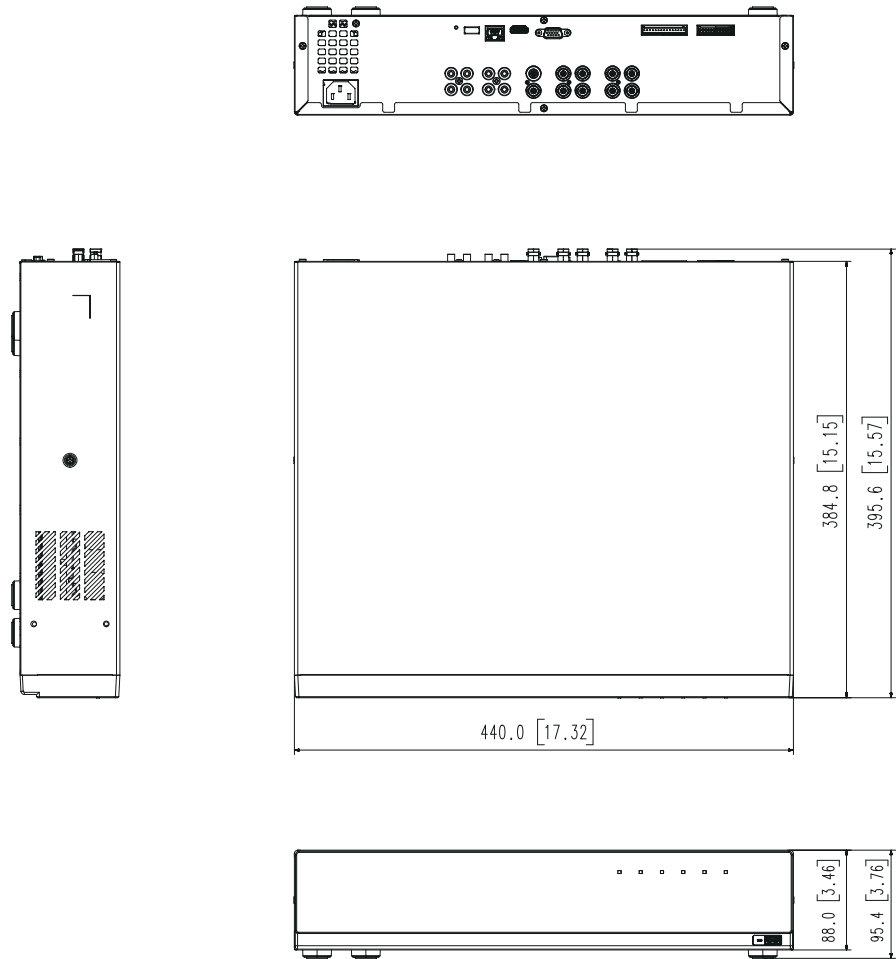


• HRX-821

unit : mm (inches)

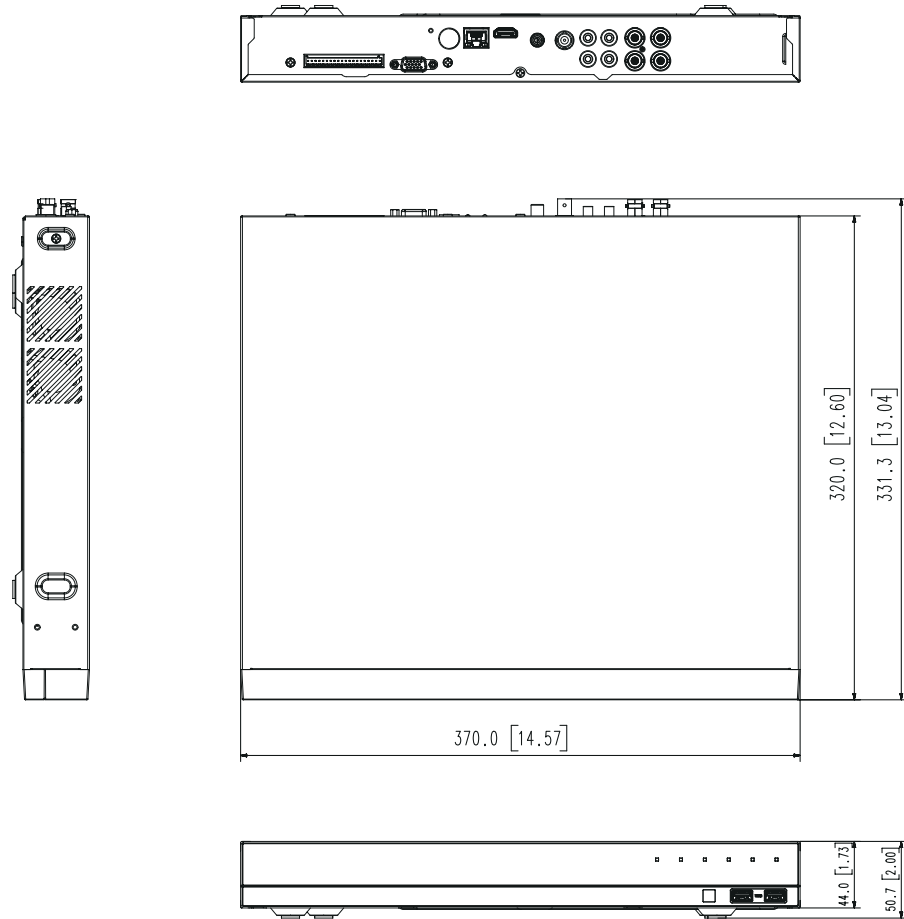
• HRX-820

unit : mm (inches)



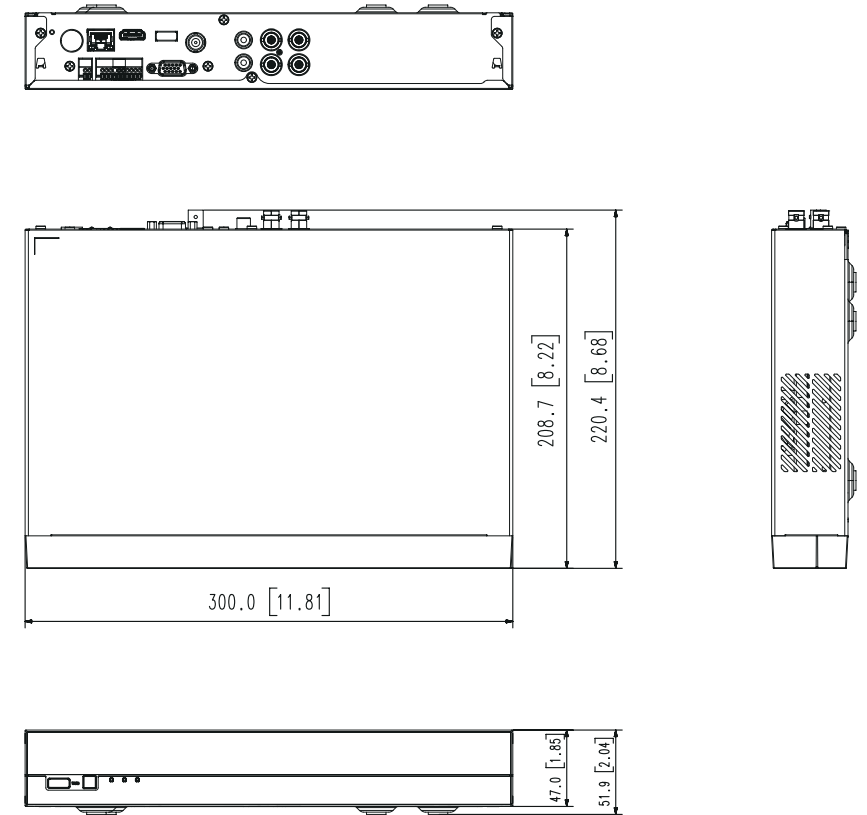
• HRX-421

unit : mm (inches)



• HRX-420

unit : mm (inches)



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- **LGPL Software:** avahi-0.6.32, ffmpeg-2.4.3, glib-2.46.2, libdaemon-0.14, libnl-3.2.25, libusb-0.1.12, libusb-0.1.5, qrencode-3.4.4, wvdial-1.61, wstreams-4.6.1, Live555, qtopia4.7.2
- **MPL 1.1:** npapi-sdk
- **BSD 2-Clause License:** FreeBSD
- **BSD 3-Clause License:** minipnp-1.5-ppc, net-snmp v5.6.2.1, ppp-2.4.5, jquery.sha256, jsbn, libjpeg-turbo, lighttpd v1.4.35, msinttypes, requires, spherical++, sprintf 0.7-, System-Verilog-Packet-Library, Text OpenGL Extension Wrangler Library 1.7.0
- **MIT License:** aptechcmsv2, avropendous, cJSON, cJSON-Dave Gamble, dynatree, javascript-ipv6, jqGrid, jQuery UI, jquery-form, jquery-hashchange, jquery-json, jquery-numeric, jquery-throttle-debounce 1.1, JS-Browser-Driver, moon9, noty, Raphael JavaScript Library, wildflower 1.3.Beta
- **libxml2 License:** libxml2 v2.7.7
- **Apache 2.0 License:** RLLib
- **zlib/libpng Lisence:** cximage, HM NIS Edit, Nullsoft Scriptable Install System 2.46, PNG reference library, tinyxml 2.6.2, zlib v1.2.8
- **Boost Software License:** boost 1.57.0
- **Curl License:** curl v7.49.1
- **Microsoft Public License:** Minima, Text Designer Outline Text Library
- **Code Project Open 1.02 License:** CPPPSQLite - C++ Wrapper for SQLite, A reusable, high performance, socket server class - Part3
- **JPEG License:** libjpeg-8b
- **RSA MD4 or MD5 Message-Digest Algorithm License:** JavaScript MD5 1.1, sjpxtpi
- **PHP License 3.01:** HPHP-2.1.0, php v5.6.33
- **OpenSSL Combined License:** openssl v1.0.2n
- **PCRE 5 License:** pcre v8.39
- **NTP License:** ntp v4.2.8p10
- **Codelgniter License:** Codelgniter
- **GLUT for Win32 License:** GLUT for Win32
- **ISC License:** dhcp 4.3-2rc2
- **Brian Gladman Alternate License:** AES with the VIA ACE
- **Acknowledgement:** This product includes modified version of ffmpeg, Live555, qtopia4.7.2 and npapi-sdk.

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Version 2, June 1991

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```

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- [11]Steve Clift <clift@mml.csiro.au> OMEGA clock driver
- [12]Casey Crellin <casey@csc.co.za> vxWorks (Tornado) port and help with target configuration
- [13]Sven Dietrich <sven_dietrich@trimble.com> Palisade reference clock driver, NT adj. residuals, integrated Greg's Winnt port.
- [14]John A. Dundas III <dundas@salt.jpl.nasa.gov> Apple A/UX port
- [15]Torsten Duwe <duwe@immd4.informatik.uni-erlangen.de> Linux port
- [16]Dennis Ferguson <dennis@mrbill.canet.ca> foundation code for NTP Version 2 as specified in RFC-1119
- [17]Glenn Hollinger <glenn@herald.usask.ca> GOES clock driver
- [18]Mike Iglesias <iglesias@uci.edu> DEC Alpha port
- [19]Jim Jagielski <jim@jagubox.gsfc.nasa.gov> A/UX port
- [20]Jeff Johnson <jbj@chatham.usdesign.com> massive prototyping overhaul
- [21]Hans Lambermont <Hans.Lambermont@nl.origin-it.com> or [22]<H.Lambermont@chello.nl> ntpsweep
- [23]Poul-Henning Kamp <phk@FreeBSD.ORG> Oncore driver (Original author)
- [24]Frank Kardel [25]<Frank.Kardel@informatik.uni-erlangen.de> PARSE <GENERIC> driver (14 reference clocks), STREAMS modules for PARSE, support scripts, syslog cleanup
- [26]William L. Jones <jones@hermes.chpc.utexas.edu> RS/6000 AIX modifications, HPUX modifications
- [27]Dave Katz <dkatz@cisco.com> RS/6000 AIX port
- [28]Craig Leres <leres@ee.lbl.gov> 4.4BSD port, ppsclock, Magnavox GPS clock driver
- [29]George Lindholm <lindholm@ucs.ubc.ca> SunOS 5.1 port

27. [30]Louis A. Mamakos <louie@ni.umd.edu> MD5-based authentication

28. [31]Lars H. Mathiesen <thorinn@diku.dk> adaptation of foundation code for Version 3 as specified in RFC-1305

29. [32]David L. Mills <mills@udel.edu> Version 4 foundation: clock discipline, authentication, precision kernel; clock drivers: Spectracom, Austron, Arbiter, Heath, ATOM, ACTS, KSI/Odetics; audio clock drivers: CHU, WWW/H, IRIG

30. [33]Wolfgang Moeller <moeller@gwdgv1.dnet.gwdg.de> VMS port

31. [34]Jeffrey Mogul <mogul@pa.dec.com> ntprtrace utility

32. [35]Tom Moore <tmoore@fievel.daytonoh.ncr.com> i386 svr4 port

33. [36]Kamal A Mostafa <kamal@whence.com> SCO OpenServer port

34. [37]Derek Mulcahy <derek@toybox.demon.co.uk> and [38]Damon Hart-Davis <d@hd.org> ARCRON MSF clock driver

35. [39]Rainer Pruy <Rainer.Pruy@informatik.uni-erlangen.de> monitoring/trap scripts, statistics file handling

36. [40]Dirce Richards <dirce@zk3.dec.com> Digital UNIX V4.0 port

37. [41]Wilfredo Sánchez <wsanchez@apple.com> added support for NetInfo

38. [42]Nick Sayer <mrapple@quack.kfu.com> SunOS streams modules

39. [43]Jack Sasportas <jack@innovativeinternet.com> Saved a Lot of space on the stuff in the html/pic/ subdirectory

40. [44]Ray Schnitzler <schnitz@unipress.com> Unixware1 port

41. [45]Michael Shields <shields@tembel.org> USNO clock driver

42. [46]Jeff Steinman <jss@pebbles.jpl.nasa.gov> Datum PTS clock driver

43. [47]Harlan Stern <harlan@pfcs.com> GNU automake/ autoconfigure makeover, various other bits (see the ChangeLog)

44. [48]Kenneth Stone <ken@sdd.hp.com> HP-UX port

45. [49]Ajit Thyagarajan <ajit@ee.udel.edu>IP multicast/anycast support

46. [50]Tomoaki TSURUOKA <tsuruoka@nc.fukuoka-u.ac.jp>TRAK clock driver

47. [51]Paul A Vixie <vixie@vix.com> TrueTime GPS driver, generic TrueTime clock driver

48. [52]Ulrich Windl <Ulrich.Windl@rz.uni-regensburg.de> corrected and validated HTML documents according to the HTML DTD

[53]gif

[54]David L. Mills <mills@udel.edu>

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53. file:///localhost/backroom/ntp-stable/html/index.htm

54. mailto:mills@udel.edu

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